

## CLAIMS

What is claimed is:

1. A storage system with multiple disk drives comprising:

an enclosure;

an interface board having a first backplane interface connector and a second backplane interface connector, said interface board being mounted in said enclosure, said interface board being substantially planar and defining an interface board plane;

a first and second backplane having a plurality of disk drive interface connectors and a backplane interface mating connector capable of mating with one of said first and second backplane interface connectors, said plurality of disk drive interface connectors being arranged in a plurality of rows and a plurality of columns, said first and second backplane being substantially planar and defining a first and second backplane plane;

a first set of disk drives electrically connected to said first backplane through said plurality of disk drive interface connectors, each of said first set of disk drives having a longest edge defining a long axis, said long axis being oriented perpendicular to said first backplane plane;

a second set of disk drives electrically connected to said second backplane through said plurality of disk drive interface connectors, each of said second set of disk drives having a longest edge defining a long axis, said long axis being oriented perpendicular to said second backplane plane;

a first guiding mechanism mounted in said enclosure, said first guiding mechanism defining a first axis of insertion, said axis of insertion being substantially perpendicular to said interface board plane, said first guiding mechanism being arranged to guide said first backplane into said enclosure such that said first backplane electrically connects to said first backplane interface connector such that said first backplane plane is substantially perpendicular to said interface plane, said first backplane and said first set of disk drives being removable from said enclosure as a first single unit; and

30            a second guiding mechanism mounted in said enclosure, said second  
guiding mechanism defining a second axis of insertion, said second axis of  
insertion being substantially parallel to said second axis of insertion, said  
second guiding mechanism being arranged to guide said second backplane  
into said enclosure such that said second backplane electrically connects to  
said second backplane interface connector such that said second backplane  
35            plane is substantially perpendicular to said interface plane, said second  
backplane and said second set of disk drives being removable from said  
enclosure as a second single unit.

2. The storage system of claim 1 further comprising:

              a first frame into which is mounted said first backplane and said first set  
of disk drives; and

              a second frame into which is mounted said second backplane and said  
5            second set of disk drives.

3. The storage system of claim 1 wherein said first backplane is substantially a  
mirror image of said second backplane.

4. The storage system of claim 1 wherein said first backplane and said second  
backplane are identical and interchangeable.

5. The storage system of claim 4 wherein said first backplane is inserted into said  
enclosure in an inverted relationship with respect to said second backplane.

6. The storage system of claim 1 wherein said interface board comprises a RAID  
controller.

7. The storage system of claim 6 wherein said first set of disk drives is a RAID  
mirror of said second set of disk drives.

8. The storage system of claim 7 wherein one of said first backplane and said  
second backplane may be removed from said enclosure while said storage system  
is operable.

9. The storage system of claim 1 further comprising a first power supply.

10. The storage system of claim 9 further comprising a second power supply.

11. A method for constructing a storage system with multiple disk drives  
comprising:

providing an enclosure;

5 providing an interface board having a first backplane interface connector and a second backplane interface connector, said interface board being substantially planar and defining an interface board plane;

mounting said interface board in said enclosure;

10 providing a first and second backplane having a plurality of disk drive interface connectors and a backplane interface mating connector capable of mating with one of said first and second backplane interface connectors, said plurality of disk drive interface connectors being arranged in a plurality of rows and a plurality of columns, said first and second backplane being substantially planar and defining a first and second backplane plane;

15 providing a plurality of disk drives;

20 electrically connecting a first set of disk drives to said first backplane through said plurality of disk drive interface connectors, each of said first set of disk drives having a longest edge defining a long axis, said long axis being oriented perpendicular to said first backplane plane;

electrically connecting a second set of disk drives to said second backplane through said plurality of disk drive interface connectors, each of said second set of disk drives having a longest edge defining a long axis, said long axis being oriented perpendicular to said second backplane plane;

25 providing a first guiding mechanism defining a first axis of insertion

mounting said first guiding mechanism in said enclosure such that said first axis of insertion is substantially perpendicular to said interface board plane, said first guiding mechanism being arranged to guide said first backplane into said enclosure such that said first backplane electrically connects to said first backplane interface connector such that said first backplane plane is substantially perpendicular to said interface plane, said first backplane and said first set of disk drives being removable from said

30 enclosure as a first single unit;

providing a second guiding mechanism defining a second axis of insertion;

mounting said a second guiding mechanism in said enclosure such that  
35 said second axis of insertion is substantially parallel to said second axis of insertion, said second guiding mechanism being arranged to guide said second backplane into said enclosure such that said second backplane electrically connects to said second backplane interface connector such that said second backplane plane is substantially perpendicular to said interface plane, said second backplane and said second set of disk drives being removable from said enclosure as a second single unit;

40 inserting said first backplane and said first set of disk drives into said enclosure using said first guiding mechanism; and

45 inserting said second backplane and said second set of disk drives into said enclosure using said second guiding mechanism.

12. The method of claim 11 further comprising:

providing a first frame;

providing a second frame;

mounting said first backplane and said first set of disk drives into said 5 first frame; and

mounting said second baa second backplane and said second set of disk drives into said second frame.

13. The method of claim 11 wherein said first backplane is substantially a mirror image of said second backplane.

14. The method of claim 11 wherein said first backplane and said second backplane are identical and interchangeable.

15. The method of claim 14 wherein said first backplane is inserted into said enclosure in an inverted relationship with respect to said second backplane.

16. The method of claim 11 wherein said interface board comprises a RAID controller.

17. The method of claim 16 wherein said first set of disk drives is a RAID mirror of said second set of disk drives.

18. The method of claim 17 wherein one of said first backplane and said second backplane may be removed from said enclosure while said storage system is operable.
19. The method of claim 11 further comprising:
  - providing a first power supply; and
  - mounting said first power supply into said enclosure.
20. The method of claim 19 further comprising:
  - providing a second power supply; and
  - mounting said second power supply into said enclosure.